

REMARKS

Favorable reconsideration and allowance of this application are requested.

1. Procedural Summary

Prosecution of the subject application was "closed" pursuant to 37 CFR §1.114(b) by virtue of the filing of a Notice of Appeal on January 12, 2009. This response is therefore being filed concurrently with a request for continued examination under 37 CFR §114 so as to reopen prosecution on the merits to allow consideration of the comments below.

2. Claim Status

Claims 1-11 as presented with the applicants' prior amendment dated March 6, 2008 remain pending in this application, of which claim 1 is in independent format.

In addition, claims 15-22 have been newly presented. Independent claim 15 is based on original claim 1 and the disclosure appearing on pages 3-4 of the specification. For example, claim 15 requires a heating step whereby having a weight average molecular weight (M_w) of at least 1×10^6 g/mol and having an initial storage plateau modulus (G^*) value of at most 0.75 MPa is heated at a heating rate (Θ) which is at most 1 K/minute to a temperature above the melting temperature of the UHMWPE to form a processable melt thereof. Step (b) of new claim 15 requires allowing the initial G^* value of the UHMWPE melt to build at a at a speed (Ψ) of less than 3 MPa/hour to a processing G^* value of at most 1.5 MPa so that the melt of the UHMWPE can be shaped while maintaining the processing G^* value of at most 1.5 MPa to form a shaped part thereof. Thereafter, prior to cooling, step (d) requires raising the G^* value of the shaped part formed according to step (c) from a G^* value of at most 1.5 MPa to a final G^* value of about 2.0 MPa; followed by cooling of the shaped part.

Dependent claims 16-22 are based on several of the prior presented claims but are dependent either directly or indirectly from new claim 15.

Therefore, following entry of this amendment, claims 1-11 and 15-22 will be pending herein for which favorable reconsideration and allowance are solicited.

3. The Claimed Invention

The present invention is directed toward a process for the preparation of a shaped part of an ultrahigh molecular weight polyethylene (UHMWPE) which includes the steps of heating the UHMWPE to a temperature above the melting temperature, shaping the resulting melt, and cooling the melt to a temperature below the melting temperature. Significantly, the process of the claimed invention further includes:

- a) providing an UHMWPE having a weight average molecular weight (M_w) of at least 1×10^6 g/mol,
- b) keeping the storage plateau modulus (G^*) of the UHMWPE during the shaping step at a value of at most 1.5 MPa, and thereafter
- c) before the cooling step, raising the G^* to its final value.

4. Response to 35 USC §§102(b) and 103(a) Rejections

A. Response to Rejection based on Burstein et al (USP 5,721,334)

Prior claims 1-11 attracted a rejection under 35 USC §102(b) as allegedly anticipated by or under 35 USC §103(a) as allegedly rendered obvious from Burstein et al.

Applicants note that the present invention is novel in several respects. For example, the present invention is novel in that a special process has been provided whereby parts may be made from *disentangled* UHMWPE – that is, disentangled UHMWPE which is synthesized in a special manner as described on page 4, line 34 to

page 5, line 10 of the original specification in that it is made a low temperature (<325K, preferably <300K) with an *unsupported* single site catalyst with a low catalyst concentration. The disentangled UHMWPE is therefore quite different from entangled UHMWPE in that it has a low G^* value of below 1.5 MPa, preferably below 0.75 MPa (see page 4, lines 6-10 of the original specification).

Applicants note that the type of catalyst per se does not determine the fact whether or not a UHMWPE is either entangled or disentangled. Instead, the catalyst type in combination with the density of active sites, speed of polymerization and the like are determinative. Moreover, it is quite difficult to prepare *disentangled* UHMWPE because normally entanglements will be present due to:

- The use of heterogeneous or supported catalysts which have a high concentration of active centers (which will increase the chance of entanglements)
- High activity of active centers (high growth rate relative to crystallization rate, also leading to more entanglements)
- High monomer pressure (high growth rate)
- High polymerization temperatures (slow crystallization, high growth rates)

Turning attention to the applied references, applicants note that Burstein discloses a process for sintering UHMWPE using as a starting material any commercial UHMWPE (see column 3, line 40). Burstein et al does not disclose or suggest sintering a *disentangled* UHMWPE. Instead, Burstein et al discloses sintering entangled UHMWPE as exemplified by 415 GUR resin commercially available from Hoechst Celanese. However, 415 GUR resin is *not* a disentangled UHMWPE, but instead is an entangled UHMWPE that would have a G^* value in excess of 1.5 MPa.

Therefore, one of ordinary skill in this art would be cognizant of the technical deficiencies of Burstein et al as described above. As such, Burstein et al would not anticipate or render obvious the presently claimed invention. Withdrawal of the rejection advanced under 35 USC §§102(b) and 103(a) is therefore in order.

B. Response to Rejection based on Rastogi et al (USP 6,433,120)

Prior claims 1-11 also attracted a rejection under 35 USC §102(b) as allegedly anticipated by or under 35 USC §103(a) as allegedly rendered obvious from Rastogi et al.

The discussion above is equally germane to the patentability of the presently claimed invention over Rastogi et al. In this regard, Rastogi et al discloses a process for processing UHMWPE having a certain lamellar thickness and melting temperature. An exemplified UHMWPE is Hostalen GUR 4130 resin. Like the 415 GUR resin disclosed in Burstein et al reference, the GUR 4130 resin is *not* a disentangled UHMWPE, but instead is an entangled UHMWPE that would have a G* value in excess of 1.5 MPa.

Therefore, withdrawal of the rejection advanced against prior claims 1-11 under 35 USC §§102(b) and 103(a) is also in order.

RASTOGI et al
Serial No. 10/561,920
August 11, 2009

5. Fee Authorization

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

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